19. The institutions from which the University receives certificates for degrees in Medicine (hereinafter called the recognised Medical Institutions) to retain their right of giving such certificates whether they be or be not constituent colleges.

20. The list of recognised medical institutions to be subject to the existing power of revision, but so that the Senate shall not report thereon without the previous advice of the Faculty of Medicine (see Charter of January 6, 1863, section 37).

IV.—Faculties

21. There shall be four faculties—viz. (1) Arts; (2) Laws; (3) Science; (4) Medicine.

22. All departments of knowledge in which examinations may be held by the University, and not included in any of the other faculties, shall be included in the Faculty of Arts.

23. Each faculty shall consist of—(*a*) the representatives of the constituent colleges; (*b*) the examiners in the faculty during their periods of office and three years afterwards; (*c*) such persons eminent in the studies with which the faculty is concerned not exceeding six in number as the faculty may elect and for such periods as they may determine.

24. Each faculty shall elect—(*a*) a chairman for three years; (*b*) three members of the Senate; (*c*) members of a board of studies.

25. The persons to be elected under the last clause must be members of the faculty not being examiners in office, and on ceasing to be members of the faculty or accepting the office of examiner such persons will vacate their seats as chairman or member of the Senate or board.

26. On any matter connected with its subjects a faculty may—(*a*) make recommendations to its board of studies in all matters within the competence of the board; (*b*) represent its views to the Senate.

V.—Boards of Studies

27. There shall be a board of studies in each faculty.

28. Each board shall consist of such a number of members being a multiple of three, and not less than six nor more than twenty-one, as the faculty shall from time to time determine, together with one member of Convocation to be elected by Convocation.

29. One-third of the faculty members shall retire each year.

30. The member elected by Convocation shall sit for three years.

31. Power to fill up occasional vacancies.

32. Power to re-elect.

33. Each board shall elect a chairman every year.

34. Each board of studies shall have the following powers and duties:—(*a*) To consider the recommendations of its faculty; (*b*) to consult together on all matters connected with the subjects of its faculty and the examinations therein and the teaching thereof; (*c*) to advise the Senate from time to time as to the institution of new degrees or any change in the degrees, or as to the regulations in force with regard to the degrees and examinations in its faculty (without which advice the Senate shall not act in the said several matters); (*d*) to consult with and advise the examiners in the faculty; (*e*) to represent its views on any matter connected with the subjects of its faculty to the Senate; (*f*) to make by way of report to its faculty such recommendations as it may think fit, with the object of insuring suitable and efficient teaching in the subjects of its faculty, and generally to report to its faculty on all matters connected with its subjects as the board may think desirable; (*g*) to summon a meeting of its faculty for the discussion of any matter relating to its subjects.

35. Boards of studies may, if they or any of them shall from time to time think it desirable, meet and act concurrently on particular subjects.

VI.—Examiners

36. The examiners in each faculty may from time to time make such reports and recommendations to the faculty or its board of studies as they may think fit.

VII.—Degrees

37. Candidates to be admitted to matriculation and all degrees other than degrees in the Medical Faculty without regard to the place of their education.

38. Candidates for degrees in the Faculty of Medicine to show that they have passed the required course of instruction in a constituent college in the Medical Faculty or in a recognised medical institution.

VIII.—General Provision

39. Except so far as altered by the foregoing provisions either directly or indirectly, the existing constitution of the University to be retained.

DANISH RESEARCHES IN GREENLAND

DURING the last few years the Danish Government have despatched several scientific expeditions to her great but sparsely populated dependency, Greenland, for the purpose of exploring it geographically, zoologically, botanically, and mineralogically, while efforts have also been made to learn something of the Norse archæological remains in South Greenland. Glacial researches, too, have been prosecuted and valuable observations made of the enormous ice-field—the inland ice, which fills the entire interior—and of its movements to the sea through the numerous fjords, the birth-place of the greatest icebergs in the northern hemisphere.

The results of these varied researches have only been published after a long delay. It should, however, be stated that the Danish Government have followed a carefully prepared plan on this point, as the Royal Commission appointed for the purpose of supervising the same, consisting of Prof. Johnstrup, Admiral Ravn, and Dr. Rink, have decided that the results of the researches should not be made public until their analysis was completed in every detail. These have been embodied in the work published by the Commission: "Videnskablige Meddelelser om Grönland" (Scientific Informations about Greenland), a publication which has gained one of the gold medals of the French Academy, and of which six or seven volumes have been published. In addition to this work we have received another, equally great, containing 109 tables, with facsimiles in colour of fossil plants found in North Greenland, defined and described by the late Prof. Oswald Heer, of Zurich, who also defined the fossils which Mr. E. Whymper, in 1867, brought home from the Disco Island and the peninsula of Noursoak, an account of which was published in the *Transactions* of the Royal Society, 1869, pp. 445–488, with eighteen lithographed plates.

Last year no less than three Danish expeditions were at work along the Greenland shores.

The first of these, under Lieut. A. Jenssen, known for his wanderings on the inland ice—was engaged in exploring and charting the district on the west coast, between Sukkertoppen and Holsteinborg (65½°–67° N. lat.), where there is a network of little unexplored fjords, between mountains rising from 6000 to 7000 feet in height, penetrating upwards of 100 miles into the broad coast-land.

The results of this expedition were very important, as the flora, fauna, and geology of this part of Greenland were ascertained. Several new plants were brought home, and the flora on a "nunatak," viz. a mountain rising above the inland ice, was collected. Lieut. Jensen is still occupied in finally drawing and describing the explored part of the coast, embracing about 1000 square miles.

The second expedition, under Lieut. J. Holm, is, in its second year, engaged in penetrating from Cape Farewell, along the barren and difficult east coast, always encircled by pack-ice. It comprises four scientists, and has for its object the exploration of the country between the 63° and 70° lat. N., where the formation of the land is much like that of Iceland.

Besides having to explore the east coast as far north as circumstances may permit, two of the members, viz. Lieut. Garde and Dr. Eberlin, have established a station at Nanortalik (lat. 60° N.), where they have, last winter, prosecuted meteorological, magnetical, and auroral observations, being a continuation of those effected during 1882-83 at Godthaab. Observations of ice and sea are also made. The two scientists who have wintered in some spot on the east coast, started, according to latest advice, from Fluidlek (lat 61½° N.), where a depot has been established, at the end of July last year, northwards, in the company of Greenlanders, eighty-two of whom lived on the east coast, and were on their way home from trading on the south coast. There were thirty-six boats in all. Late in July the great glacier Puisortok, which reaches down to the sea, and which in 1830 caused Graah, the only European who had hitherto visited it, so much trouble—was passed without much difficulty. Soon after Tingmiarmint (lat. 62° 40′ N.) was reached, the northernmost place whence we have news of the party. It was their intention to attempt to reach a place, Augmaksalik, in lat. 65½° N., before the winter, where there is a settlement of Greenlanders, but which has never been visited by Europeans. It lies near the place where Nordenskiöld landed in 1883 without seeing any natives. In the spring of the present year the coast will be explored, but we shall have no news of the party until they return home. Lieut. Holm states that the east Greenlanders were very kind and friendly. They were all heathens. They were particularly remarkable for their features, being tall people, generally with dark eyes and hair, and without any trace of the Eskimo. However, that they should be descendants of Norsemen seems hardly probable on account of their uncivilisation and want of religion, Norse language, and traditions. The party at Nanortalik have explored eight great fjords, between lat. 62½° and 60½° N., right to the bottom, without finding the least trace of Norse remains.

The expedition may be expected to return at the end of 1885. There is, however, great probability of the party under Lieut. Holm having to spend another year on these inhospitable shores, where the European, in order to exist, has to live like the Eskimo.

While the above-mentioned two expeditions were chiefly confined to explorations, the third one despatched last entered upon an almost unbroken field for research, viz., the sea on the west coast. Between 1876 and 1879 researches of the Denmark Sound—*i.e.*, the sea between Iceland and Greenland—were effected by the Danish Admiralty Expedition, whereas Davis Strait and Baffin's Bay have only been cursorily studied, as, for instance, by H.M.S. *Valorous* on its return journey in 1875, after having provisioned Sir George Nares, and by the Nordenskiöld Expedition of 1883.

The vessel employed for last year's researches was the *Fylla* gun-boat, in command of Capt. C. Normann. The scientific staff were—Prof. E. Warming, botanist; Mr. Th. Holm, zoologist; and Dr. H. Topsöe, chemist and mineralogist. The hydrographical researches were made by the officers; and for the purpose of examining the flora and fauna of the sea the expedition was provided with trawls and scrapers of most improved American pattern, and, for the deep-sea researches and measurements of temperature, with a Sigsbee's sounding-apparatus with wire rope and a good collection of the necessary instruments. For the determination of the temperature of the sea, thermometers by Negretti and Zambra were mostly used, some of which were fitted with the splendid automatic reversing apparatus invented by Capt. Magnaghi, of the Italian Navy, and some with one constructed by Capt. G. Rung, of the Copenhagen Meteorological Institute, by which the turning of the instruments is effected at a given time by the simultaneous freeing of a weight running in the line. The Miller-Casella thermometers, with which the expedition were furnished, were used very little, on account of the existing high bottom temperatures.

For fetching water from various depths, water-carriers on Sigsbee's (American), Ekman's (Swedish), and Rung's (Danish) principles were used, the latter being a new invention, which was very practicable for lesser depths, as it not only brings the sample of water required, but also gives the exact temperature, a thermometer being hidden in the axis of the vessel, the mercury column of which is broken as soon as it is full.

The *Fylla* left Copenhagen at the end of May, and arrived, at the end of June, at Godthaab, a colony with 300 to 400 Eskimo inhabitants, on the west coast of Greenland, in lat. 64½° N. Hydrographical researches were commenced early by following the edge of the Polar ice from Cape Farewell, which, during the summer, filled the southern and eastern parts of Davis Strait in vast quantities, and by studying the position of the ice-belt and the composition of the water inside and outside the ice current.

We have no space to give a detailed account of the movements of the expedition in the Greenland seas; it must be sufficient to state that the expedition, being chiefly stationed at Holsteinborg (67° N. lat.), visited most of the Danish settlements in Central Greenland, its field of research lying between 64° and 70° N. lat., and from the innermost creek at Disco Bay (about 50° W. long.) to the middle of Davis Strait,—*i.e.*, to about 57½° W. long. An attempt to get further west, and, if possible, reach the coast of America at Cape Walsingham and Cumberland Bay, had to be abandoned on account of the enormous ice-masses which were encountered there in July, and which, in the middle of August, when the *Fylla* was on her return journey, had, in 67° N. lat., approached within 50 to 60 miles of the shores of Greenland, which is very unusual at that season.

The deep-sea researches consisted in sounding, trawling, and scraping, both on the extensive banks which, between 62° and 68° N. lat., nearly everywhere surround the shores of Greenland with a deep channel between them and the coast, and in the Davis Strait.

The researches did not extend to very low depths, the greatest found being only about 900 fathoms south-west of Godthaab, while on the *bridge* connecting Greenland with Cape Walsingham, at the place where Davis Strait is narrowest—in about lat. 67° N.—depths of 400 fathoms only were struck. In the Disco Bay, where no soundings had previously been taken, a depth varying from 200 to 270 fathoms was found, and it has been discovered by the *Fylla* Expedition that at the mouth, at a depth of 180 to 190 fathoms, a barrier separates this basin from Davis Strait, and thus prevents icebergs of a greater draught from passing from the great fjord of Jacobshavn into the ocean. Judging by the results of the measurements of icebergs effected during recent years in this fjord by Prof. Steenstrup and Lieut. Hammer for the purpose of ascertaining the proportion between the part above and the part below the surface of the water, it has been found that only icebergs with an *average* height above the surface of 150 feet can float over this threshold, the proportion between the part above and the part below water being 1 to 8·8—*i.e.* 1 : 8·41 for blistered glacier ice, and 1 : 9·23 for glacier ice without blisters. For sea-water ice with a water saltness of 3·3 per cent. the proportion is only 1 : 5·29.

The numerous samples of water taken from the surface, bottom, and intermediary depths, during the voyage have not yet been thoroughly analysed, and before this has been done, it is hardly possible to say anything definite as to the currents at various depths. This much is, however, certain—that a comparatively warm current of water fills the eastern and central parts of the narrowest portion of Davis Strait—as far as the western ice limit—but that the highest temperature of the same, when the depth is more than a couple of hundred fathoms, is not, as is generally the case, found at the surface, *but nearest the bottom*, and that the coldest layer seems to lie between 30 and 100 fathoms. As an example may be taken the following series of temperatures obtained in lat. 67° 07′ N. and long. 56° 31′ W. on July 8, 1884, the temperature of the air being ÷ 1°·9 C.

At the surface	+2°·8 C.
,, 10 fathoms	1·9
,, 30 ,, ...	0·9
,, 100 ,, ...	1·1
,, 200 ,, ...	3·6
,, 362 ,, (bottom)	4·2

Similar conditions were also found everywhere in Disco Bay, but the surface water in this confined basin was considerably warmer, while the bottom temperature was proportionately lower.

We will give an example from lat. 69° 14′ N. and long. 52° 54′ W., on the morning of July 23, the temperature of the air in calm sunny weather being + 10°·2 C. in the shade :—

At the surface	+7°·7 C.
,, 5 fathoms	7·1
,, 10 ,, ...	4·2
,, 20 ,, ...	1·4
,, 30 ,, ...	+0·1
,, 50 ,, ...	+0·2
,, 70 ,, ...	+0·1
,, 100 ,, ...	0·6
,, 130 ,, ...	0·9
,, 200 ,, ...	1·8
,, 264 ,, (bottom)	2·1

That the influence of the ice-fjord is here felt at the intermediary depths is obvious even without any chemical analysis of the water of the various layers. It is, however, very remarkable that the surface-temperature in such a high latitude, and in water constantly covered with enormous icebergs, *can*, in the short summer, reach such a height as the above series show. This is, by the bye, so far from being a solitary example that most serial temperatures from this locality, which were, however, all taken in calm weather, and extended over seven days, show a much higher surface-temperature.

The highest temperature was registered off the colony of Christianshaab, in the Disco Bay, in the south-eastern corner, viz. + 11°·4 C. at the surface. At five fathoms it fell, however, to 2°·8, and stood from 30 to 100 fathoms at + 0°·2 C. That the icebergs in these waters must melt rapidly, particularly at the water-line, is clear, which was also corroborated by experience, all being deeply furrowed and heeling over.

The trawlings and scrapings extended to a depth of 300 fathoms, and were effected as well in Davis Strait, Disco Bay, on the banks, as in the fjords. The result was considerable, and several varieties of fauna previously unknown in the Greenland seas were caught, as well as some entirely new species. Among the rarest forms may be mentioned *Amblyops abbreviata*, *Mysideis grandis*, and *Boreomysis nobilis*, which are only known in a few species from the west coast of Norway, and *Spirorbis cancellatus*.

The harvest was richest on the banks, as was the case under previous expeditions, and poorest in Disco Bay, where several hauls at a depth of 200 to 250 fathoms brought up absolutely nothing, or only a couple of specimens of the same species. The trawl worked here so far down in the soft black clay, which everywhere covers the bottom, that the line constantly threatened to break. The expedition has brought home a total of 300 specimens of the deep-sea fauna.

During the stay in port the officers of the vessel were engaged in hydrographical labours, chiefly the measuring of certain harbours, and the botanists in excursions into the long, narrow fjords, where the vegetation is richest, but neither the mountains nor the islands were forgotten. The harvest was very rich. Of phanerogams and higher cryptogams alone specimens of 230 varieties were obtained, and five new plants were discovered, among which a new species of Carex, while several were found in entirely new places, whereby their geographical distribution has been increased with several degrees of latitude. Thus, *Linnæa borealis*, for the first time, in 1883, discovered in Greenland, and then in lat. 61° 10′, was this year found as far north as 67°. Special attention was also given to the collecting of materials for illustrating the development of the Arctic fauna, which has hitherto been neglected. Great attention, too, was paid to the algæ fauna, although it is very poor in the places visited by the expedition.

The mineralogical harvest of the expedition was poor, for the reason that Greenland has already been thoroughly explored, geologically and geodetically, by such eminent scientific men as Sir C. L. Giesecke, Dr. Rink, Profs. Johnstrup, Steenstrup, and Nathorst, that little more is to be learnt. One object of interest was, however, brought home—viz. a block of ironstone found on the shore of the Disco Island at Uifak, in lat. 69° 20′ N., of the same kind as those discovered there by Baron Nordenskiöld some years ago, and which were at first believed to be meteorites, but whose terrestrial origin must now be said to be beyond question, in consequence of Prof. Steenstrup having discovered nickel iron in lumps of all sizes, of exactly the kind as that contained in these blocks in the great basalt strata of the Disco Island. The block which weighs about 1800 lbs., has been presented to the Mineralogical Museum at Copenhagen, where it will be mounted, with those already brought thither from the same locality.

The scientific material collected by the expedition is under treatment, but considerable time must elapse before the final result is ascertained.

This spring another expedition has been despatched to Greenland, being the tenth since 1876. It is commanded by Lieut. Jensen, and has for its object, besides natural history and photographical studies, the survey of the west coast between Sukkertoppen and Godthaab, lat 65½°—64° N. This is the last stretch of the west coast which remains to be surveyed, and if Lieut. Jensen succeeds in finishing the work this year, the entire west coast of Greenland from lat. 59½° to 72½° N. will have been surveyed and charted.

That the Danes are proud of the accomplishment of this great and difficult work is only natural.

THE ROYAL SOCIETY OF CANADA

THE fourth annual meeting was held at Ottawa on May 26 and following days to the 29th inclusive; the President, T. Sterry Hunt, LL.D., F.R.S., in the chair. The following papers were read in Section III. (Mathematical, Physical, and Chemical):—On the analysis of silk, by Dr. H. A. Bayne, Royal Military College. The author selected samples of pure silk and linen and cotton (their purity being carefully determined beforehand by the use of the microscope), and after removing dressing material, colouring matter, &c., by ether and dilute hydrochloric acid, submitted all four samples to the action of a large number of reagents in order to determine to what extent solvents of silks affect other fibres also. The result of a large number of analyses showed that, for mixtures of silk and wool, basic zinc chloride is the most reliable reagent; while for mixtures of silk and cotton or linen, Lœwe's alkaline glycerine solution of oxide of copper gives the most trustworthy indications.—Mémoire sur l'introduction et l'interprétation rationelle des quantités négatives et des quantités imaginaires dans le calcul, by Dr. D. Duval.—Classification of natural silicates, by Dr. T. Sterry Hunt, F.R.S.—Blowpipe reactions on plaster tablets, by Prof. Haanel. This was in continuation of previous investigations.—Note on the quantitative blowpipe assay of Cinnobar, by Prof. Haanel.—On the determination in terms of a definite integral of the value of the expression—

$$\frac{1}{\underline{|m+n}}\left\{\left(x+\frac{n}{2}\right)^{m+n}-n\left(x+\frac{n}{2}-1\right)^{m+n}+\ldots\right.$$
$$(-1)^r\frac{\underline{|n}}{\underline{|n-r}\,\underline{|r}}\left(x+\frac{n}{2}-r\right)^{m+n}+\ldots+$$
$$\left.(-1)^n\left(x-\frac{n}{2}\right)^{m+n}\right\}$$

the series to be continued only as long as the quantity raised to power $m + n$ is positive, n being a positive integer, and m a positive integer, zero, or a negative integer numerically less than n; and on the deduction therefrom of approximate values in certain cases, by C. Carpmael, M.A. In this paper, after pointing out that the investigation of M. Cauchy fails when m is zero or an integer, although he assumed without comment that it would hold, the author proceeds to determine the values of a number of "extraordinary integrals" and obtains results different from those obtained by M. Cauchy, although his final approximate values agree with them if we correct certain numerical errors in Cauchy's results.—The geognosy of crystalline rocks, by T. Sterry Hunt, F.R.S.—Concernant la théorie de M. Steckel sur la veine liquide contractée, by C. Baillargé.—On tidal observations in Canadian waters, by A. Johnson, L.H.D., showing the very imperfect state of our knowledge of the tides, and the need of systematic observations on both the Atlantic and Pacific coasts.—On iron ores from Central Ontario. This paper comprises a series of analyses of magnetic and other iron ores from the counties of Peterborough and Hastings in the province of Ontario, with brief references to the conditions of occurrence of the various deposits from which the ores were taken, by Prof. Chapman.—A commentary on section ix. of Newton's "Principia," by Prof. Cherriman, M.A.—The density of weak aqueous solutions of certain salts, by Prof. MacGregor, D.Sc.—Redetermination of the difference of longitude between the observatories of McGill College, Montreal, and Harvard Observatory, by Prof. W. A. Rogers (Harvard) and Prof. McLeod (McGill College).—Redetermination of the differences of longitudes of Montreal, Toronto, and Coburg, by Messrs. Carpmael, M.A., McLeod, M.E., and Chandler, M.A.—Notes on (1) Clausius's theory of the virial; (2) the motion of a rigid body with one point fixed; (3) the equation of energy in generalised coördinates.—Geometrical methods in optics, by Prof. Loudon.—Notes on the economic minerals of New Brunswick, with a revised list of mineral localities in the province, by Prof. Baily. This paper being of the nature of a catalogue of localities, was not read before the Section.—Geology of Cornwallis or McNab's Island, Halifax Harbour, by Rev. Dr. Honeyman. A study of the local geology in which special reference was made to the occurrence of amygdaloidal boulders which were considered to have been derived from the vicinity of Cape Blomidon.—A Catalogue of Canadian Butterflies, with notes on the distribution of the genera, by W. Saunders. Explained merely in a few remarks, not being suited for reading in full.

The following papers were read in Section IV. (Geological and Biological):—On the Mesozoic floras of the Rocky Mountain region of Canada, by Sir W. Dawson.—Fossil plants from the Trias and Permian of Prince Edward Island, by Sir W. Dawson.—Illustrations of the fauna of the St. John group (third part), by G. F. Matthew. This paper was in continuation of former communications. It describes a large number of Cambrian forms, particularly trilobites, and discusses the relations of the subdivisions of the Cambrian of the vicinity of St.